

WHAT IS CLAIMED IS:

1 1. A multispectral focal plane array comprising:
2 a linear array of photodetectors, each photodetector in the
3 linear array having a distinct spectral response; and
4 an integrated circuit coupled to a read out of the linear
5 array, wherein the integrated circuit collects electrical
6 signals from the individual photodetectors.

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1 2. A multispectral focal plane array comprising:
2 a two-dimensional array of photodetectors having groups of
3 photodetectors, each group having a distinct spectral response;
4 and
5 an integrated circuit coupled to a read out of the two-
6 dimensional array, wherein the integrated circuit collects
7 electrical signals from the photodetectors.

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1 3. The multispectral focal plane array of claim 1 wherein the
2 photodetectors are, either photodiodes or photoconductors.

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1 4. The multispectral focal plane array of claim 2 wherein the
2 photodetectors are, either photodiodes or photoconductors.

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1 5. The multispectral focal plane array of claim 1 wherein the
2 photodetectors are fabricated from epilayers of ternary or
3 quaternary compound semiconducting materials whose band-gap
4 varies via a grading of the chemical composition of the
5 photodetector.

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1 6. The multispectral focal plane array of claim 2 wherein the
2 photodetectors are fabricated from ternary or quaternary
3 compound semiconducting materials whose band-gap varies through
4 a grading of the chemical composition of the photodetector.

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1 7. The multispectral focal plane array of claim 1 wherein the
2 photodetectors vary in height and are fabricated from epilayers
3 of compositionally graded compound semiconducting material such
4 that the height of the photodetector determines the distinct
5 spectral response of photodetector.

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1 8. The multispectral focal plane array of claim 2 wherein the
2 photodetectors vary in height and are fabricated from epilayers
3 of compositionally graded compound semiconducting material such
4 that the height of the photodetector determines the distinct
5 spectral response of photodetector.

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1 9. The multispectral focal plane array of claim 7 wherein any
2 photodetector of a given height is a broadband detector which
3 detects more long-wavelength photons than those photodetectors
4 which are shorter and fewer long-wavelength photons than those
5 photodetectors which are taller.

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1 10. The multispectral focal plane array of Claim 8 wherein any
2 group of photodetectors of a given height are broadband
3 detectors which detect more long-wavelength photons than those
4 groups of photodetectors which are shorter and fewer long-
5 wavelength photons than those groups of photodetectors which are
6 taller.

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1 11. The multispectral focal plane array of Claim 1 wherein the
2 photodetector array is formed of rows of photodetectors each of
3 a distinct height, fabricated from a continuously graded
4 epilayer of compound semiconductor, wherein each row of the two-
5 dimensional array corresponds to a distinct spectral response.

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1 12. The multispectral focal plane array of Claim 2 wherein the
2 photodetector array is formed of groups of rows of
3 photodetectors, wherein each group is a distinct height,
4 fabricated from a step-wise graded epilayer of compound

5 semiconductor, wherein each group of rows of the two-dimensional
6 array corresponds to a distinct spectral response.

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1 13. The multispectral focal plane array of claim 1 wherein the
2 photodetector array is a continuously graded epilayer formed of
3 rows of pixels, wherein each row of the two-dimensional array
4 corresponds to a distinct spectral response.

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1 14. The multispectral focal plane array of claim 2 wherein the
2 photodetector array is a continuously graded epilayer formed of
3 rows of pixels, wherein each row of the two-dimensional array
4 corresponds to a distinct spectral response.

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1 15. The multispectral photodetector array of claim 11 wherein
2 the ternary or quaternary compound semiconducting material
3 system is formed of $\text{Hg}_{1-x}\text{Cd}_x\text{Te}$, wherein the band gap of $\text{Hg}_{1-x}\text{Cd}_x\text{Te}$
4 varies with chemical composition (x value).

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1 16. The multispectral photodetector array of claim 12 wherein
2 the ternary or quaternary compound semiconducting material
3 system is formed of $\text{Hg}_{1-x}\text{Cd}_x\text{Te}$, wherein the band gap of $\text{Hg}_{1-x}\text{Cd}_x\text{Te}$
4 varies with chemical composition (x value).